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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,420	06/19/2003	Jiyang Yan	DP-308706	7012

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DELPHI TECHNOLOGIES, INC.  
M/C 480-410-202  
PO BOX 5052  
TROY, MI 48007

EXAMINER

HAILEY, PATRICIA L

ART UNIT PAPER NUMBER

1755

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/600,420

Applicant(s)

YAN, JIYANG

Examiner

Patricia L. Hailey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-8, and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 2, 2006, has been entered.

Applicants' submission included an amendment; claims 1 and 13-16 have been amended. No claims have been canceled or added.

Claims 1, 3-8, and 13-16 remain pending in this application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

3. ***Claims 1, 3-8, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al. (U. S. Patent Application Publication No. 2003/0124037) in view of Canadian Patent No. 2,299,602 (hereinafter "the Canadian Patent").***

Voss et al. disclose an apparatus for treating diesel engine exhaust comprising a catalyzed filter in communication with a diesel engine (having an exhaust outlet), and a second catalyst in communication with the first catalyst. See paragraph [0020] of Voss et al., as well as paragraph [0049], which discloses various applications for the

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apparatus, including treatment of waste gas streams such as internal combustion engine exhaust, nitric acid plant tail gases, etc.

The first catalyst preferably comprises a first platinum group metal component (such as platinum, palladium, and rhodium, see paragraph [0031]), a first cerium component, and preferably a first zirconium component. Where a second catalyst is used in combination with the first catalyst, as a separate catalytic element or as part of the soot filter (soot being carbonaceous particulates, see paragraph [0019]), a preferred second catalyst composition comprises a second cerium component and preferably a second platinum group metal component. See paragraphs [0024]-[0025] of Voss et al., which also disclose metal oxides such as silica, alumina, titania, zirconia, silica-alumina, and ceria-zirconia as exemplary second catalyst composition components.

The catalyzed filter can comprise any suitable filter substrate, such as a wall-flow honeycomb substrate. See paragraph [0053] of Voss et al., as well as Figures 2 and 3.

The first catalyst components are preferably present in amounts ranging from about 0.1 to 200 g/ft<sup>3</sup> (0.0035 to 7.062 g/L). See paragraph [0058] of Voss et al.

The wall-flow substrate has an inlet end and an outlet end, and additionally comprises a plurality of channels, such that each channel is blocked at one end, of the substrate, with alternate channels blocked at opposite end-faces. The wall-flow substrate exhibits a wall thickness of between 0.002 and 0.1 inches (50.8 to 2540 micrometers), and preferably between 0.007 and 0.03 inches (200 to 750 micrometers). Further, the wall-flow article may have the catalytic elements present thereon on the

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inlet side of the element wall alone, the outlet side alone, or on both the inlet and outlet sides. See paragraphs [0080] to [0083] of Voss et al.

The above disclosures are considered to read upon Applicants' claims regarding the provision of a wall-flow substrate and the catalyst applied thereto (e.g., claims 1, 3-5, 14-16). Further, the claim limitations regarding (1) the pore size ratios between the catalyst composition and the substrate, (2) the increase in balance point temperature, (3) penetration of the inlet wall of the substrate by the catalyst composition, and (4) the catalyst composition content at the outlet wall of the substrate, are also considered encompassed by Voss et al., in view of the teachings therein, and in view of Applicant's claim recitations "less than or equal to".

Although Voss et al. disclose a "general method of preparation of the catalyst composition" wherein, for example, an aqueous slurry of ceria particles and other components such as metal oxide particles (optionally impregnated with the platinum or palladium metal component) is applied to the carrier, dried and calcined to form a catalytic material coating thereon (paragraphs [0071]-[0073]), the reference does not teach or suggest the method steps recited in claim 1.

The Canadian Patent discloses a method for producing a catalyst material by providing a powdered aluminum oxide stabilized with basic oxides as support material, impregnating the support material with a solution of at least one precursor compound of alkaline earth and rare earth metals ("first slurry"), drying the impregnated support material and calcining it at temperatures below 800°C, repeating the aforementioned impregnation and drying steps until the desired loading with basic oxides is achieved;

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additional impregnation of the obtained material with a solution of precursor compounds of catalytically active noble metals ("second slurry"), and finally drying and calcining.

See page 6, lines 10-25 of the Canadian Patent.

The stabilized aluminum oxide is preferably aluminum oxide doped with 1 to 10 wt. % lanthanum oxide ("doped aluminum oxide", "lanthanum doped aluminum oxide"). See page 7, lines 3-23 of the Canadian Patent, as well as page 8, line 25 to page 9, line 19, which discloses that the aluminum oxide may be doped with additional basic oxides such as those of magnesium, calcium, strontium, barium, cerium, praseodymium, neodymium, samarium, europium, terbium, and ytterbium (page 9, lines 11-19; "promoter oxide precursor").

Examples of the catalytically active noble metals include platinum, palladium, rhodium, and iridium. See page 10, lines 3-11 of the Canadian Patent, which also discloses the concentrations thereof, with respect to the total weight of catalyst material.

Example 1 of the Canadian Patent depicts an embodiment of Patentees' catalyst material, wherein an aluminum oxide stabilized with lanthanum oxide ("support material 1", see page 13, lines 22-26) is mixed with cerium/zirconium mixed oxide, and impregnated with platinum and palladium, and the impregnated mixture is dried and calcined. Next, the powder is stirred with water to give an aqueous suspension, and milled to a particle size of 3 to 5  $\mu\text{m}$ . The solids in the dispersion were applied to a support structure (e.g., a cordierite honeycomb structure) using an immersion method, followed by aging for 4 hours at 1100°C in an atmosphere of nitrogen, water, and

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oxygen (considered to read upon the last two steps in Applicants' claim 1). See also page 16, lines 3-11 and page 17, lines 7-21 of the Canadian Patent.

The claim limitations regarding (1) the pore size ratios between the catalyst composition and the substrate, (2) the increase in balance point temperature, (3) penetration of the inlet wall of the substrate by the catalyst composition, and (4) the catalyst composition content at the outlet wall of the substrate, are also considered encompassed by the Canadian Patent, in view of the teachings therein, and in view of Applicant's claim recitations "less than or equal to".

The catalyst material prepared by the method of the Canadian Patent is "particularly suitable for...the treatment of exhaust gases from internal combustion engines." See page 1, lines 8-10 of the Canadian Patent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Voss et al. by incorporating therein the method disclosed in the Canadian Patent, and thereby obtain Applicants' claimed invention, because the apparatus comprising the wall-flow substrate disclosed in Voss et al. is suitable for the treatment of waste gas streams such as internal combustion exhaust. See paragraph [0049] of Voss et al.

### ***Response to Arguments***

In response to Applicants' arguments that the cited references, when combined, do not teach or suggest Applicants' claimed invention, the Examiner respectfully disagrees. Voss et al., as set forth above, read upon Applicants' claims regarding the

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diesel particulate filter, e.g., by disclosing a wall-flow substrate, upon which catalytic elements may be present either on the inlet side, the outlet side, or upon both sides.

Further, Voss et al. at paragraphs 71-73 disclose preparation of the catalyst, and the application thereof to the carrier, which is considered to read upon Applicants' claims as well:

"However, preferably, the ceria particles or both the ceria and metal oxide particles are impregnated with a compound of the platinum or palladium catalytic metal before a coating of the ceria second metal oxide catalytic material is applied to the carrier...

Generally, the slurry of ceria and metal oxide particles,...whether or not impregnated with the platinum or palladium metal salt solution, will be deposited on the carrier substrate and dried and calcined to adhere the catalytic material to the carrier..."

Voss et al. do not teach the claim limitations regarding sizing the catalyst, which is disclosed by the Canadian Patent.

Further, motivation to combine the references is considered proper, as both references disclose relevance to treating exhaust gases. Moreover, the Canadian Patent is relied upon for its teachings regarding the preparation of the catalyst.

In response to Applicants' arguments that the cited references of record do not "suggest a formulation that is intended to penetrate porosity of a substrate for a diesel particulate filter", it is the Examiner's position that Applicants' claim limitation "to cause said catalyst-bearing particles to penetrate within the pores of the porous wall to a distance less than or equal to about 25% of the thickness of the porous wall", is

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considered to encompass a distance of zero (0) percent penetration, which is equivalent to coating. Further, in the mere application of the catalyst to the surface of the carrier, penetration of the catalyst into said surface is expected to some extent.

For these reasons, Applicants' arguments are not persuasive.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
September 11, 2006

  
J. A. LORENGO  
SUPERVISORY PATENT EXAMINER